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10/806,694	03/22/2004	Lester F. Ludwig	2152-3036	2364
96907	7590	09/09/2010	EXAMINER	
Lester F. Ludwig			XIAO, KE	
P.O. Box 128			ART UNIT	PAPER NUMBER
Belmont, CA 94002			2629	
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			09/09/2010	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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# Office Action Summary

**Application No.**

10/806,694

**Applicant(s)**

LUDWIG, LESTER F.

**Examiner**

Ke Xiao

**Art Unit**

2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 July 2010.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 3-33 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1 and 3-33 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/SI/225)  
4) ☐ Interview Summary (PTO-413)  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_  
Paper No(s)/Mail Date \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1, 3-25 and 27-33** are rejected under 35 U.S.C. 103(a) as being unpatentable over Armstrong (US 5,565,891) in view of Kim (US 6,424,335).

Regarding **Claim 1**, Armstrong teaches a user interface device comprising:

a hand-held housing (Armstrong, Figs. 2, 3 and 8):

a first user interface element (Armstrong, Fig. 8 entire device);

a second user interface element configured with the hand-held housing comprising a freely rotating trackball configured to be displaceable in two independent directions relative to the hand-held housing responsive to pressure applied to the trackball (Armstrong, Figs. 2 and 3 elements 102, 106, 118 and 122);

a displacement sensor generating sensor signals independently responsive to each of the two independent directions of displacement of the trackball relative to the hand-held housing (Armstrong, Figs. 2 and 3 elements 102, 106, 118 and 122) and signal circuitry producing an outgoing displacement signal responsive to the sensor signals (Armstrong, Figs. 2 and 3 element 130).

Armstrong fails to teach a first user interface element configured as claimed and a multiplexer and a common output signal as claimed.

Kim teaches a first user interface element configured with the hand-held housing and generating a first plurality of signal responsive to movement of the hand-held housing relative to two orthogonal axes (Kim, Figs. 2A-2D mouse moves on the table plane); and a multiplexer for combining the signals from a first user interface element and from a displacement sensor and the second user interface element into a common output signal (Kim, Fig. 25 mouse and trackball in one, Col. 17 line 66 to Col. 18 line 11 multiplexing signals to operate simultaneously), whereas the common output signal is capable of being de-multiplexed to provide separate parameters for simultaneously controlling different functions by manipulating the first user interface element and the second user interface element (Kim, Col. 7 line 55 - Col. 8 line 12).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the multiplex function of Kim to the system of Armstrong in order to provide more flexible use of the user input device by allowing both exclusive-or mode of operation as well as simultaneous mode operation of the device (Kim, Figs. 2 and 25, Col. 7 line 55 - Col. 8 line 12).

Regarding **Claim 3**, Armstrong further teaches that the trackball is displaceable in three independent directions (Armstrong, Figs. 2 and 3 xyz), wherein

the displacement sensor generates the sensor signals responsive to the three independent directions of the displacement of the trackball (Armstrong, Fig. 2 and 3 elements 102, 106, 118, 122 and 110).

Regarding **Claims 4-6**, Armstrong further teaches a rotation sensor generating a rotation sensor signal responsive to three independent components of rotation applied to the trackball (Armstrong, Fig. 7), wherein

the signal circuitry further produces an outgoing rotational signal responsive to the rotational sensor signal (Armstrong, Fig. 2 element 130).

Regarding **Claims 7-10**, Armstrong in view Kim of fails to teach that the displacement sensor is a variable resistive, variable capacitive, electro magnetic, or optical element. The examiner takes official notice that all of these elements are well known in the art to be used as displacement sensors in trackball devices for sensing depression of the trackball. It would have been obvious to one of ordinary skill in the art at the time of the invention to use any of the above elements as the displacement sensor because each of them would perform the task of detecting the depression just as well and all of said elements are easily obtained and integrated into a trackball device.

Regarding **Claims 11 and 12**, Armstrong further teaches that the displacement sensor comprises a pressure sensor made of a switch (Armstrong, Fig. 2 and 3 elements 102, 106, 118, 122 and 110).

Regarding **Claim 13**, Armstrong further teaches that the outgoing displacement signal defines a click event (Armstrong, Fig. 2 elements 108 and 110).

Regarding **Claim 14**, Armstrong further teaches that the outgoing displacement signal is one parameter of a widely varying adjustable parameter (Armstrong, Figs. 1-3 X and Y displacement are widely varying parameters).

Regarding **Claim 15**, Armstrong teaches a user interface device comprising:

a hand-held housing (Armstrong, Fig. 8);  
a first user interface element (Armstrong, Fig. 8);  
a second user interface element configured with the hand-held housing comprising a freely rotating trackball configured to rotate relative to the hand-held housing (Armstrong, Fig. 2 and 3 elements 102, 106, 118, 122 and 110);  
a rotation sensor generating a sensor signal responsive to one or more of three independent directions of rotation of the trackball (Armstrong, Fig. 7); and  
signal circuitry producing an outgoing rotational signal responsive to the rotation sensor (Armstrong, Figs. 2, 7 and 8 element 130).

Armstrong fails to teach a first user interface element configured as claimed and a multiplexer and a common output signal as claimed.

Kim teaches a first user interface element configured with the hand-held housing and generating a first plurality of signal responsive to movement of the hand-held housing relative to two orthogonal axes (Kim, Figs. 2A-2D mouse moves on the table plane); and a multiplexer for combining the signals from a first user interface element and from a displacement sensor and the second user interface element into a common output signal (Kim, Fig. 25 mouse and trackball in one, Col. 17 line 66 to Col. 18 line 11 multiplexing signals to operate simultaneously), whereas the common output signal is capable of being de-multiplexed to provide separate parameters for simultaneously controlling different functions by manipulating the first user interface element and the second user interface element (Kim, Col. 7 line 55 - Col. 8 line 12).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the multiplex function of Kim to the system of Armstrong in order to provide more flexible use of the user input device by allowing both exclusive-or mode of operation as well as simultaneous mode operation of the device (Kim, Figs. 2 and 25, Col. 7 line 55 - Col. 8 line 12).

Regarding **Claim 16**, Armstrong further teaches that the three independent directions of rotation of the trackball respectively comprise roll, pitch and yaw of the trackball (Armstrong, Fig. 7).

Regarding **Claim 17**, Armstrong further teaches that the signal circuitry comprises a signal processor (Armstrong, Fig. 2 element 130).

Regarding **Claim 18**, Armstrong further teaches a first of the three rotation component signals is generating in response to rotational roll of the trackball, a second of the three rotation component signals is generating in response to rotational pitch of the trackball, a third of the three rotation component signals is generating in response to rotational yaw of the trackball (Armstrong, Fig. 1 elements 124, 126 and 128).

Regarding **Claims 19-25** Armstrong in view of Kim fails to teach that the rotation sensor is a capacitive, optical, light polarization, magnetic, electro magnetic, or acoustic sensor. The examiner takes official notice that all of these sensors are well known in the art to be used as rotation sensors in trackball devices for sensing rotation of the trackball. It would have been obvious to one of ordinary skill in the art at the time of the invention to use any of the above sensors as the rotation sensors because each of them would perform the task of detecting the rotation just as well, and all of said sensors are

easily obtained and integrated into a trackball device. Additionally acoustic sensors detect resonance and magnetic sensors detect polarization component.

Regarding **Claim 27**, Armstrong further teaches that the hand-held housing has a saddle assembly configured to be displaceable within the housing responsive to pressure applied to the trackball (Armstrong, Fig. 2 element 16 and 20);

a displacement sensor generating a displacement sensor signal responsive to the displacement of the saddle assembly relative to the housing (Armstrong, Fig. 2 elements 16, 20, 108 and 110); and

the sensor signal circuitry further producing an outgoing displacement signal responsive to the displacement sensor signal (Armstrong, Fig. 2 element 130).

Regarding **Claims 28 and 29**, Armstrong further teaches that the displacement sensor comprises a pressure sensor that is a switch configured to generate a displacement sensor signal as a non-binary signal (Armstrong, Fig. 2 elements 108 and 110, Col. 3 lines 25-31 the sensor can be a number of different types of switches such as resistive, capacitive, piezoelectric all of which generate analog signals which are considered non-binary).

Regarding **Claim 30**, Armstrong further teaches that the outgoing displacement signal defines a click event (Armstrong, Fig. 2 elements 108 and 110).

Regarding **Claim 31**, Armstrong further teaches that the outgoing displacement signal is one parameter of a widely varying adjustable parameter (Armstrong, Fig. 1 X and Y displacement are widely varying parameters).



Regarding **Claims 32 and 33**, Armstrong further teaches that the saddle assembly is displaceable in three independent directions (Armstrong, Figs. 2 and 4 X, Y and Z directions), wherein

the displacement sensor generates the sensor signal responsive to the three independent directions of the displacement of the saddle assembly (Figs. 2, 5 and 6 elements 108 and 110).

**Claim 26** is rejected under 35 U.S.C. 103(a) as being unpatentable over Armstrong (5,565,891) in view of Kim (US 6,424,335) as applied to claims 1, 3-25 and 27-33 in further view of Yokoji (US 6,909,422).

Regarding **Claim 26**, Armstrong in view of Kim fails to teach that one direction of the three independent directions of rotation defines a click event. Yokoji teaches that a click event can be associated with any direction of rotation of a trackball (Yokoji, Figs. 2 and 7, Col. 2 lines 1-35).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the click event as taught by Yokoji to the rotational directions of Armstrong and Kim in order to provide a rotational haptic feedback to the user.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1, 3-25 and 27-33 have been considered but are moot in view of the new ground(s) of rejection.

The examiner would like to point out that the amendment to independent claims 1 and 15 require a new interpretation of multiplexer because of the "into a common output signal" limitation.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ke Xiao whose telephone number is (571)272-7776. The examiner can normally be reached on Monday through Friday from 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ke Xiao/  
Examiner, Art Unit 2629